

REMARKS

Amendments

Claims 15, 16 and 17 are amended to delete superfluous language and to replace "gas" by "gasoline" for the sake of consistency. Claims 22 and 24 are amended to correct the obvious typographical errors noted by the Examiner. These amendments do not narrow the scope of the claims.

New claims 31-41 are directed to further aspects of the invention and are supported throughout the disclosure. See, e.g., page 4, lines 5-23; page 5, lines 18-28; page 6, lines 23-30; page 13, lines 11-17; and the Figures.

Claim Objections

The objections to claims 15, 16, 22, 24, and 27 are rendered moot by the above amendments. Withdrawal of the objections is respectfully requested.

Peyton and the Rejections under 35 U.S.C. §103

In each of the rejections under 35 U.S.C. §103, the excerpt from the Ondeo/Nalco Fuel Field Manual by Peyton is relied on as prior art. However, this excerpt is not prior art with respect to applicants' invention. The copyright date listed for the Peyton excerpt is "2002, 1998." Even if the excerpt has the earlier copyright date (the rejection does not establish which date is applicable), the excerpt is not prior to applicants' earliest US filing date of September 23, 1997 (the filing date of parent application serial No. 08/936,101). Thus, **none** of the prior art rejections are applicable because they are not based on a combination of the prior art. Withdrawal of all rejections is respectfully requested.

Rejections Under 35 U.S.C. §103: Watkins (US 3,161,586) and Peyton

Claims 12, 15, 16, 19-21, 27, 28, and 30 are rejected as allegedly being obvious in view of Watkins (US '586) and the excerpt from the Ondeo/Nalco Fuel Field Manual by Peyton. This rejection is respectfully traversed.

Watkins (US '586) discloses a process for hydrotreating an unsaturated, coke-

forming hydrocarbon distillate. The process comprises initially fractionating the distillate to provide a light fraction having an end boiling point of from about 200° F to about 300° F, and a heavy fraction having an initial boiling point above about 200° F. One of the fractions, preferably the heavy fraction, is reacted with hydrogen in a first reaction zone at a temperature less than about 500° F. At least a portion of the effluent from this first zone is combined with the other fraction (the "other" fraction preferably being the light fraction) and the resultant mixture is reacted with hydrogen in a second reaction zone at a temperature of less than about 500° F. The effluent from the second zone is heated and the introduced into a third reaction zone where it is reacted with additional hydrogen at a temperature in excess of about 500° F. The effluent from the third reaction zone is then separated into a gaseous product and a liquid product, and separate portions of the liquid product are combined the light and heavy fractions prior to these fractions being reacted in the first and second reaction zones. See, e.g., column 3, line 28-column 4, line 34 and the Figure.

Watkins (US '586) states that the presence of mono-olefins and diolefins during hydrotreating will induce the formation of coke and high-molecular weight polymerizates. To overcome this problem, Watkins (US '586) conducts the hydrotreating process in individual stages. In a first stage, the distillate is treated, in the presence of hydrogen, at a temperature of less than about 500° F, to provide at least a partial saturation of the diolefins and mono-olefins. The distillate is then subsequently treated at a temperature in excess of 500° F., to remove contaminants and complete saturation of olefinic hydrocarbons. See column 3, lines 1-13.

Watkins (US '586) also state that the inclusion of heavier unsaturated hydrocarbons, those boiling above about 300° F., will result in a deleterious degree of copolymerization with the lighter, unsaturated hydrocarbons. To avoid this problem, Watkins (US '586) separates the feedstock into a light fraction and heavy fraction and then, at least initially, treats these fractions separately. See, e.g., column 3, lines 13-21 and column 4, lines 57-72.

As mentioned above, it is preferred in the process of US '586 that the heavy fraction be the one treated in the first zone, rather than the light fraction. US '586 discloses that treating the heavy fraction in the first zone because this requires less recycled hydrotreated

product to the second zone. See column 6, lines 4-14.

As is acknowledged in the rejection, US '586 does not disclose a sweetening zone, particularly a sweetening zone after a stripping zone. However, the rejection refers to the disclosure of US '586 at column 8. However, contrary to the assertion in the rejection, this does not provide motivation to modify the disclosed process of US '586 so as to arrive at an embodiment in accordance with, for example, any of applicants' claims 15, 16 and 27.

At column 8, lines 21-27, US '586 merely generally mentioned that the embodiment illustrated in the figure can be modified. However, the mere ability to modify a disclosure does not establish motivation. See, e.g., *In re Laskowski et al.*, 10 USPQ2d 1397 (Fed. Cir. 1989).

Thereafter, at column 8, lines 27-237 US '586 describes modification of the separator 24 whereby it is combined with absorbing means such as water-injection into line 23 (the line feeding separator 24) or treating the gaseous phase removed from separator 24 via line 25 (which is subsequently recycled by lines 15 and 18). These modifications both occur **before** the stripping zone and thus provide no suggestion as to modifications of the system after the stripping zone.

At column 8, lines 37-42 US '586 refers to providing a hydrotreated product recycle storage vessel. This also provides no suggestion as to modifications of the system after the stripping zone.

In addition, Watkins et al. do not disclose a system having both a stripping zone, used in the treatment of the light fraction, and a stripping column, used in treatment of the heavy fraction. Compare applicants' claim 27.

Peyton, as discussed above, is not prior art. Moreover, the mere disclosure of the existence of sweetening processes does not provide motivation for modifying the process of US '586 so as to arrive at an embodiment in accordance with, for example, any of applicants' claims 15, 16 and 27.

In view of the above remarks, it is respectfully submitted that US '586, taken alone or in combination with the Peyton excerpt, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection Under 35 U.S.C. §103: Watkins (US '586), Peyton and Cosyns et al. (US

4,208,271)

Claims 22-24 are rejected as allegedly being obvious in view of US '586 in combination with Peyton and Cosyns et al. (US '271). This rejection is respectfully traversed.

U.S. '586 and Peyton have been discussed above. U.S. '271 is directed to a process for treating pyrolysis gasolines. See, e.g., column 3, lines 13-24. In the process, gasoline is hydrogenated in two distinct catalyst beds. In the first catalyst bed, gasoline and hydrogen are contacted with a catalyst comprising supported palladium metal. Then, in the second catalyst bed, gasoline and hydrogen are contacted with a catalyst comprising supported nickel metal. The catalyst beds are said to be operated under conventional operating conditions of gasoline selective hydrogenation, whereby at least a partial removal of mercaptans and hydrogen sulfide and at least a partial hydrogenation of the gum-generating compounds (without excessive hydrogenation of the monoolefins) is insured.

US '271 does not disclose or suggest subjecting the effluent from a stripping zone to a sweetening process, especially in cases where the feed to the stripping zone has already been subjected to hydrotreatment. Thus, US '271 provides no suggestion or motivation to lead one of ordinary skill in the art to modify the process of US '586 so as to arrive at an embodiment in accordance with, for example, any of applicants' claims 15, 16 and 27.

Moreover, US '271 discloses two distinct catalyst beds, one containing palladium and one containing nickel. US '271 does not disclose or suggest a catalyst containing both palladium and nickel or gold. Compare, applicants' claim 22.

In view of the above remarks, it is respectfully submitted that US '586, taken alone or in combination with the Peyton excerpt and/or US '271, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection Under 35 U.S.C. §103: Louie et al. (US 4,990,242), Peyton and Watkins (US '586)

Claims 16, 20, 21 and 30 are rejected as allegedly being obvious in view of Louie et al. (U.S. '242) in combination with Peyton and US '586. This rejection is respectfully traversed.

US '242 describes a process for hydrotreating petroleum distillate feedstocks

wherein, after splitting the feedstock, the two fractions are separately subjected to hydrotreatment. The separate hydrotreatments can be done in parallel hydrotreating zones or in a single hydrotreating zone wherein the fractions are alternately fed thereto (see Figures 1 and 2). US '242 disclose that the "primary advantage" of the different hydrotreating zones is a reduction of hydrogen consumption. The catalysts used are said to be of a conventional nature. The examples of catalyst mentioned are molybdena on alumina, cobalt molybdate on alumina, nickel molybdate on alumina, nickel tungstate and combinations thereof. Further, it is stated that a "preferred application for molybdena catalyst is sweetening or the removal of mercaptans."

As illustrated in Figure 1, the process described in U.S. '242 is a hydrotreatment process in which a petroleum distillate feed stock is first split via fractionation to provide at least two different boiling point fractions. One of the fractions is the top distillate stream which has a low sulphur content (e.g., a 350/575°F fraction) and the other is a lower distillate stream which has a relatively concentrated sulphur content (e.g., a 575/700°F fraction). See column 3, lines 9-25 and column 4, lines 12-21. The process of Figure 1 utilizes two hydrotreatment zones, each of which contains a catalyst. There is no description or suggestion of a reactor containing a palladium catalyst (compare applicants' claim 20). In the first hydrotreatment zone, the top distillate stream from the fractionation step is subjected to hydrotreatment with an excess of hydrogen to obtain a first effluent. In the second hydrotreatment zone, the lower distillate stream, in admixture with excess hydrogen, is subjected to hydrotreatment to produce a second effluent. See column 4, lines 3-64. The two hydrotreatment zones can operate under different reaction conditions such as different pressures, see, e.g., column 5, lines 15-30.

Rather than using two separate hydrotreatment zones, a single hydrotreatment zone can be used wherein the two feeds sent to the single hydrotreatment zone are alternated, as illustrated in Figure 2. See, e.g., column 3, lines 34-35 and column 6, line 62 - column 7, line 47.

U.S. '242 is silent with respect to the disclosure of any sweetening zone. The "light caustic wash" described at column 6, lines 37-40, is said to be for the removal of H₂S. Moreover, the indication that the molybdena catalyst provides sweetening or removal of mercaptans suggests away from a sweetening zone subsequent to hydrotreatment and/or

stripping.

Peyton, as discussed above, is not prior art. Moreover, the mere disclosure of the existence of sweetening processes does not provide motivation for modifying the process of US '242 so as to arrive at an embodiment in accordance with, for example, any of applicants' claims 15, 16 and 27.

U.S. '242 is also silent with regards to a selective diene hydrogenation zone. In particular, U.S. '242 provides no disclosure or suggestion of a selective diene hydrogenation zone between a fractionation column and a hydrotreatment zone. Throughout the disclosure, the fractions from the fractionation column are heated and then delivered directly to a hydrotreatment zone. There is no suggestion or subjecting the light fraction to selective diene hydrogenation.

In the rejection it is asserted that it would be obvious to modify the process of US '242 so as to provide selective hydrogenation between fractionator 2 and hydrotreatment 9 to minimize coke and/or polymerization product formation in the hydrotreatment zone 9. Yet, there is nothing in the rejection which suggests that one would expect appreciable formation of coke or polymerization products to occur in hydrotreatment zone 9 which treats the light fraction.

US '586 discloses that the inclusion of heavier unsaturated hydrocarbons with the lighter, unsaturated hydrocarbons results "in a deleterious degree of copolymerization" during hydrotreatment. See column 3, lines 13-21. Thus, it would be seem more logical to fractionate the feedstock into a heavy and light fraction and initially subject the heavy fraction to hydrogenation separate from the lighter fraction before further hydrotreatment, as is done in the Figure of US '586.

In view of the above remarks, it is respectfully submitted that U.S. '242, taken alone or in combination with Peyton and/or U.S. '586, fails to render obvious Applicants' claimed invention. Withdrawal of the rejection under 35 U.S.C. §103 is respectfully requested.

Rejection Under 35 U.S.C. §103: Louie et al. (US '242), Peyton, Watkins (US '586) and Cosyns et al. (US '271)

Claims 22-24 are rejected as allegedly being obvious in view of US '242 in

combination with Peyton, US '586 and Cosyns et al. (US '271). This rejection is respectfully traversed.

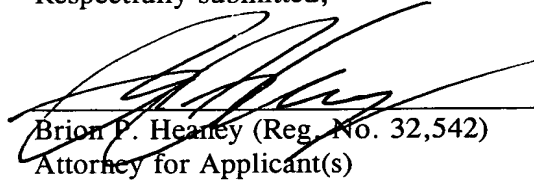
The disclosure of Cosyns et al. (US '271) does not overcome the deficiencies discussed above with regards to the combined disclosures of US '242, Peyton, and US '586. Moreover, the mere disclosure of other catalysts does not provide motivation to use catalysts other than those used by US '242. Furthermore, US '271 does not disclose or suggest a catalyst containing both palladium and nickel or gold. Compare, applicants' claim 22.

In view of the above remarks, it is respectfully submitted that U.S. '242, taken alone or in combination with Peyton and/or U.S. '586, fails to render obvious Applicants' claimed invention. Withdrawal of the rejection under 35 U.S.C. §103 is respectfully requested.

In view of the above remarks, favorable reconsideration is courteously requested. If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone Counsel at the number indicated below.

Favorable reconsideration is courteously requested. If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone Counsel at the number indicated below.

Respectfully submitted,



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